

From glowbugs@theporch.com Thu Dec 28 02:05:00 1995  
Return-Path: glowbugs@theporch.com  
Received: from uro (localhost.theporch.com [127.0.0.1]) by uro.theporch.com  
(8.7.3/AUX-3.1.1) with SMTP id BAA06288; Thu, 28 Dec 1995 01:59:28 -0600 (CST)  
Date: Thu, 28 Dec 1995 01:59:28 -0600 (CST)  
Message-Id: <199512280759.BAA06288@uro.theporch.com>  
Errors-To: ws4s@midtenn.net  
Reply-To: glowbugs@theporch.com  
Originator: glowbugs@theporch.com  
Sender: glowbugs@theporch.com  
Precedence: bulk  
From: glowbugs@theporch.com  
To: Multiple recipients of list <glowbugs@theporch.com>  
Subject: GLOWBUGS digest 59  
X-Listprocessor-Version: 6.0c -- ListProcessor by Anastasios Kotsikonas  
X-Comment: Please send list server requests to listproc@theporch.com  
Status: 0

#### GLOWBUGS Digest 59

Topics covered in this issue include:

- 1) Re: The Breadboard Lives  
by mjsilva@ix.netcom.com (michael silva)
- 2) Re: The Breadboard Lives  
by "C. J. Hawley Jr." <hawley@aries.scs.uiuc.edu>
- 3) bypassing silicon rectifiers  
by mburke@beast.sme.siemens.com (Michael Burke)
- 4) chokes from other devices  
by Bruce Robertson <brucerob@epas.utoronto.ca>
- 5) Re: chokes from other devices  
by bill@texan.frco.com (William Hawkins)

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Date: Wed, 27 Dec 1995 00:44:54 -0800  
From: mjsilva@ix.netcom.com (michael silva)  
To: glowbugs@theporch.com  
Subject: Re: The Breadboard Lives  
Message-ID: <199512270844.AAA18587@ix5.ix.netcom.com>

Eric Ness wrote:

>...I was extremely dissapointed by the loud hum that swamped  
>out all but the loudest signals....I decided to bypass the  
>rectifier diodes and that did it. The hum was gone and I had a quick  
>and dirty power supply for my experiments.  
>

>The question I have is WHY does this work.

Eric, this sounds like the same problem direct conversion receivers can have. It's been a while since I read about the exact mechanism but it sounds like RF from your detector was getting into the diodes, either back along the power leads, or via radiation from the detector into the house wiring. Once in the diodes it would mix with the 60 Hz AC and produce all those sums and differences that nonlinear devices are so good at, including the original detector frequency modulated with 60 or 120 Hz, hence the buzz. By putting caps across the diodes you removed (shorted out) the detector/carrier signal from your moonlighting "mixers".

This is just semi-informed speculation on my part. If anybody has a better explanation please chime in.

73,  
Mike, KK6GM

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Date: Wed, 27 Dec 1995 09:54:24 -0600  
From: "C. J. Hawley Jr." <hawley@aries.scs.uiuc.edu>  
To: EricNess@aol.com  
Subject: Re: The Breadboard Lives  
Message-ID: <30E16C30.1EE9@aries.scs.uiuc.edu>

EricNess@aol.com wrote:

> snip  
> After throwing everything together, I tried the supply out on the 3A4 regen  
> receiver I built. I was extremely dissapointed by the loud hum that swamped  
> out all but the loudest signals. Why would there be such a hum when I had  
> such a huge filter cap and my receiver used very little current at all (two  
> mA max)? After trying many things unsuccessfully, I decided to bypass the  
> rectifier diodes and that did it. The hum was gone and I had a quick and  
> dirty power supply for my experiments.  
>  
> The question I have is WHY does this work. This technique is a standard fix  
> for broad band noise generated by linear power supplies used in computer  
> equipment. I have done this often as part of my work but never thought much  
> about why this works. Any theories?

I'm not following exactly how you bypassed the diodes, but the most common mistake in wiring power supplies is to take your CIRCUIT ground from the junction of the diodes rather than the other end of the wire that goes to the gnd side of the filter capacitor. What happens is that the ripple current thru that wire causes a ripple

voltage to appear at the diode junction and this voltage is in series with the supply voltage across the circuit. Just a thought. I wish I had a dollar for the number of times that I rewired a power supply that the Techs built with this repeated error included. No amount of instruction seemed to be sufficient to counteract the difficulty of visualizing the ground circuits as a series of invisible wires instead of as a single point which they appear to be on a schematic.

While I'm reminiscing, I remember that the physics course which covered electronics made a big deal of how one end of the wire was the same as the other end on a schematic. Not true.

Chuck.

>

> Eric, WD6DGX

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Charles Jack Hawley Jr.  
Amateur Radio KE9UW (A.K.A. 'Chuck' in Ham Radio)  
BMW K100RS, BMWMOA #224 (A.K.A. 'Jack' in Motorcycles)  
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Date: Wed, 27 Dec 95 14:30:38 EST  
From: mburke@beast.sme.siemens.com (Michael Burke)  
To: glowbugs@theporch.com  
Cc: mburke@scr.siemens.com  
Subject: bypassing silicon rectifiers  
Message-ID: <9512271930.AA19113@beast.sme.siemens.com>

In response to Eric's (WD6DGX) query, I believe the problem arises because solid-state rectifiers are 'hard' and tube rectifiers are 'soft'. What this means is that, because the silicon rectifier has a very low (0.7V) forward conductance threshold (even less for Schottky diodes) and very low 'on' resistance, a switching transient occurs at the beginning and end of every half cycle in which the rectifier is conducting. This transient generates a lot of 60 hz harmonics. One cure is to parallel connect to the rectifier diode a small (say, .01 uf) capacitor of sufficient voltage rating (typically 3 to 4 times the peak reverse voltage appearing across the rectifier diode). The capacitor 'softens' the turn-on waveform and effectively, filters out the harmonics. Tube



Entering gingerly into the realm of the tube,

72, VE3UWL

Bruce G. Robertson Dept. of Classics, U. of T.

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Date: Wed, 27 Dec 95 22:26:31 CST  
From: bill@texan.frco.com (William Hawkins)  
To: brucerob@epas.utoronto.ca, glowbugs@theporch.com  
Subject: Re: chokes from other devices  
Message-ID: <9512280426.AA28929@texan.frco.com>

Jerry proc just went through this on boatanchors. Using other iron for chokes, that is. The kicker is that center tapped power xfmrs and push-pull audio iron have windings that balance out the DC that would otherwise saturate the core. I'd be surprised if that 30W output transformer was single ended (pretty big tube), but if it is, it could work. Chokes usually have an E core with a bar across the open end of the E, instead of interleaved E's, so that a gap can be put in the magnetic circuit to reduce the DC saturation effect.

Come to think of it, Jerry's in Toronto, too. Wonder why there's no iron up there? :-)

Since you need DC in the choke to test its inductance, it would probably be best to breadboard the power supply, and use a variable AC supply to see if the iron behaves like a choke or a resistor. That would give you the tube drop, too.

Bill Hawkins bill@bvc.frco.com 612 895-2085 Minneapolis, MN USA

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End of GLOWBUGS Digest 59  
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